AFHRL-TP-88-12 DTIC FILE COPY

(2)

AIR FORCE HUMAN RESOURCES LABORATORY

AD-A198 850

THE AIR FORCE TRAINING DECISIONS SYSTEM:
MODELING JOB AND TRAINING FLOWS

Jimmy L. Mitchell
David S. Vaughan
Robert M. Yadrick

Systems Engineering and Analysis
McDonnell Douglas Astronautics Company
Box 516
St. Louis, Missouri 63166

Daniel L. Collins, Major, USAF
José M. Hernandez, Captain, USAF

TRAINING SYSTEMS DIVISION
Brooks Air Force Base, Texas 78235-5601

September 1988

Interim Technical Paper for Period 22-23 April 1988

Approved for public release; distribution is unlimited.

AIR FORCE SYSTEMS COMMAND
BROOKS AIR FORCE BASE, TEXAS 78235-5601

Unclassified

SECURITY CLASSIFICATION OF THIS PAGE

REPORT DOCUMENTATION PAGE

Form Approved OMB No 0704-0188

1a. REPORT SECURITY CLASSIFICATION Unclassified	1b. RESTRICTIVE MARKINGS
2a. SECURITY CLASSIFICATION AUTHORITY	3. DISTRIBUTION/AVAILABILITY OF REPORT Approved for public release; distribution is unlimited.
2b. DECLASSIFICATION/DOWNGRADING SCHEDULE	
4. PERFORMING ORGANIZATION REPORT NUMBER(S)	5. MONITORING ORGANIZATION REPORT NUMBER(S) AFHRL-TP-88-12
6a. NAME OF PERFORMING ORGANIZATION McDonnell Douglas Astronautics Company 6b. OFFICE SYMBOL (If applicable)	7a. NAME OF MONITORING ORGANIZATION Training Systems Division
6c. ADDRESS (City, State, and ZIP Code) Box 516 St. Louis, Missouri 63166	7b. ADDRESS (City, State, and ZIP Code) Air Force Human Resources Laboratory Brooks Air Force Base, Texas 78235-5601
8a. NAME OF FUNDING/SPONSORING ORGANIZATION Air Force Human Resources Laboratory 8b. OFFICE SYMBOL (If applicable) HQ AFHRL	9. PROCUREMENT INSTRUMENT IDENTIFICATION NUMBER F33615-83-C-0028
8c. ADDRESS (City, State, and ZIP Code) Brooks Air Force Base, Texas 78235-5601	10. SOURCE OF FUNDING NUMBERS PROGRAM ELEMENT NO: 62703F; PROJECT NO: 7734; TASK NO: 12; WORK UNIT ACCESSION NO: 01

11. TITLE (Include Security Classification)
The Air Force Training Decisions System: Modeling Job and Training Flows

12. PERSONAL AUTHOR(S)
Mitchell, J.L.; Vaughan, D.S.; Yadrick, R.M.; Collins, D.L.; Hernandez, J.

13a. TYPE OF REPORT	13b. TIME COVERED	14. DATE OF REPORT (Year, Month, Day)	15. PAGE COUNT
Interim	FROM ______ TO ______	September 1988	42

16. SUPPLEMENTARY NOTATION
Paper presented at the Third Annual Society for Industrial and Organizational Psychology Midyear Conference, Dallas, Texas, April 22-23, 1988.

17. COSATI CODES

FIELD	GROUP	SUB-GROUP
05	08	
05	09	

18. SUBJECT TERMS (Continue on reverse if necessary and identify by block number)
automated decision aid, Field Utilization Subsystem, job and training flow, managers preferences, specialty models, Training Decisions System,

19. ABSTRACT (Continue on reverse if necessary and identify by block number)

The Training Decisions System (TDS) uses information about clusters of related tasks (Task Training Modules or TTMs), a dynamic model of specialty job flows and training programs, and data on unit training capacities and costs, to compare job and training options. In the prototype TDS development, graphic and mathematical models of four Air Force specialties and several alternative Utilization and Training (U&T) Patterns were created. Managers preferences for the various alternatives were collected through a survey questionnaire. Results were highly favorable; analysis indicated a high degree of agreement among raters. A post hoc analysis suggested some systematic differences of opinion among subgroups of raters. Managers evaluated the project very favorably and indicated the models had successfully captured and communicated the U&T Patterns of the four occupations.

20. DISTRIBUTION/AVAILABILITY OF ABSTRACT ☒ UNCLASSIFIED/UNLIMITED ☐ SAME AS RPT ☐ DTIC USERS	21. ABSTRACT SECURITY CLASSIFICATION
22a. NAME OF RESPONSIBLE INDIVIDUAL Nancy J. Allin, Chief, STINFO Office	22b. TELEPHONE (Include Area Code): (512) 536-3877 22c. OFFICE SYMBOL: AFHRL/TSR

DD Form 1473, JUN 86 *Previous editions are obsolete.* SECURITY CLASSIFICATION OF THIS PAGE

Unclassified

AFHRL Technical Paper 88-12

September 1988

THE AIR FORCE TRAINING DECISIONS SYSTEM: MODELING JOB AND TRAINING FLOWS

Jimmy L. Mitchell
David S. Vaughan
Robert M. Yadrick

Systems Engineering and Analysis
McDonnell Douglas Astronautics Company
Box 516
St. Louis, Missouri 63166

Daniel L. Collins, Major, USAF
José M. Hernandez, Captain, USAF

TRAINING SYSTEMS DIVISION
Brooks Air Force Base, Texas 78235-5601

Reviewed and submitted for publication by

Winston Bennett
Skills Development Branch

Paper presented at the Third Annual Society for Industrial and Organizational Psychology Midyear Conference, Dallas, Texas, April 22-23, 1988.

SUMMARY

The Training Decisions System (TDS) is a computer-based decision support system which is being developed to provide a more unified and integrated approach to Air Force training programming and planning. The TDS uses information about clusters of related tasks (Task Training Modules or TTMs), a dynamic model of specialty training programs and job flows, and data on unit training capacities and costs to compare suggested job and training options. In the prototype TDS development, graphic and mathematical models were created of Utilization & Training (U & T) Patterns for four Air Force specialties. Managers preferences were collected through a field survey for the curent and alternative U & T Patterns for the specialties. Results for the Avionic Inertial and Radar Navigation Systems specialty (AFS 328X4) are displayed to illustrate typical outcomes of the study. Correlational analysis indicated a high degree of agreement among raters. A post hoc analysis indicated some systematic differences in opinion among various types of managers. The managers evaluated the project very favorably and indicated the models had successfully captured and communicated the U & T Patterns of the four occupations.

PREFACE

The Training Decisions System (TDS) research and development (R&D) effort is sponsored by HQ USAF/DPPT and HQ ATC/TTXR. TDS is being accomplished under Project 7734 and is designed to provide a more integrated approach to Air Force training policy decisions and programs. For a more complete overview of the TDS, see AFHRL-TP-87-25 (AD-A183 978), Training Decisions System: Overview, Design, and Data Requirements, August 1987. For more details of the Field Utilization Subsystem (FUS) of the TDS, see the references listed in the bibliography of this paper.

This paper was presented at the Third Annual Society for Industrial and Organizational Psychology (SIOP) Midyear Conference, Dallas, Texas, on April 23, 1988, as part of a Symposium on Air Force Training Research and Development, Chaired by Dr. H. W. Ruck, Technical Advisor, Training Systems Division, Air Force Human Resources Laboratory. Since no Proceedings are published of SIOP conferences, this paper is being published as an AFHRL Technical Paper to help document the development of the TDS and for distribution to those not able to attend the SIOP meeting.

TABLE OF CONTENTS

		Page
I.	INTRODUCTION	1
II.	TDS OVERVIEW	1
III.	MODELING AIR FORCE CAREER FIELDS	3
IV.	CONCLUSIONS	13
REFERENCES		14
APPENDIX A:	U&T PATTERN PREFERENCES SURVEY, AFS 328X4	17

LIST OF FIGURES

Figure		Page
1	Current AFS 328X4 Utilization and Training Pattern	4
2	AFS 328X4 Basic Resident Course Content	6
3	Example Job Description for AFS 328X4	7
4	Avionic Inertial and Radar Navigation Systems (AFS 328X4) Probabilities	8
5	Alternative U&T Pattern Number 1	10
6	Alternative U&T Pattern Number 4	10
7	Alternative U&T Pattern Number 6	10

LIST OF FIGURES

Table		Page
1	Overall Preferences for AFS 328X4	11
2	AFS 328X4 Preferences by Subgroup	12
3	Evaluation of the AFS 328X4 U&T Preference Survey	13

THE AIR FORCE TRAINING DECISIONS SYSTEM: MODELING JOB AND TRAINING FLOWS

I. INTRODUCTION

The Training Decisions System (TDS) is a computer-based decision support system being developed by McDonnell Douglas Corporation and the CONSAD Research Corporation for the United States Air Force, to provide a more unified and integrated approach to training programming and planning. The TDS uses information about clusters of related tasks (Task Training Modules or TTMs), combined with a dynamic model of specialty training programs and job flows, along with data on unit training resources and costs, to compare alternative job and training options (Ruck, 1982; Vaughan et al., 1984; Collins et al., 1987; Ruck and Collins, 1987). The objective of the system is to help Air Force managers optimize critical and costly training decisions. This is done through systematic collection and analysis of various types of quantitative information, and processing such data into formats which are understandable and usable by Air Force managers in making critical decisions.

II. TDS OVERVIEW

Due to the scope and complexity of Air Force training, the challenge to decision makers is in deciding <u>what to train</u> (training content), <u>where to train</u> (appropriate training settings), and <u>when to train</u> (at what point in an airman's career), and in selecting the most cost-effective training option among the available alternatives. TDS integrates training requirements with manpower and cost considerations into a single comprehensive model. The TDS is structured into several major subsystems to facilitate the collection and processing of the required information and data (Vaughan et al. 1984).

<u>The Task Characteristics Subsystem</u> (TCS) uses occupational survey (OS) data as a starting point in the analysis of an occupational field or specialty and its training requirements. OS data are collected routinely by the USAF Occupational Measurement Center in the USAF occupational analysis program (AFR 35-2). For TDS purposes, the survey data are reprocessed to examine how various sets of tasks are co-performed, under the assumption that tasks which are performed together probably share underlying skills and knowledges and thus require similar training. The output of this analysis is a clustering of tasks into TTMs, the groups of tasks which should be trained together and thus form the basic unit of analysis for training decisions (Perrin, Vaughan, Yadrick & Mitchell, 1985).

Through the development of TTMs, the number of units which need to be analyzed and managed can be reduced drastically. For example, in the Avionic Inertial and Radar Navigation Systems specialty (AFS 328X4), the 778 tasks of the USAF Job Inventory were clustered into 83 TTMs, thus greatly simplifying training management and decision making.

The TCS has a number of other purposes including defining feasible allocations, estimating both current and ideal training times, and collecting training allocation preferences. Such data are gathered by field surveys of senior technicians in the field, and the data are processed to derive relative proficiency functions for each TTM in each training setting.

The Field Utilization Subsystem (FUS) has three major functions: (a) to describe current and alternative Utilization and Training (U & T) Patterns (how airmen move through various jobs, training states, and proficiency levels to become fully capable specialty technicians); (b) to associate training requirements (in terms of TTMs) with current and possible alternative jobs, as well as to characterize both present and proposed training programs in similar terms; and (c) to assess managers' preferences for specific combinations of jobs and training programs (alternative U & T Patterns) and make visible preference patterns for use in decision making. The use of TTMs as a common ground for both identifying jobs and specifying training needs ensures the critical linkage between job tasks and training requirements (Yadrick, Vaughan, Perrin, & Mitchell, 1985; Mitchell, Vaughan, Yadrick & Collins, 1987).

The Resource/Cost Subsystem (RCS) serves three distinct yet interrelated purposes. One purpose is to determine the types and amounts of resources required to provide training on each TTM in each training setting. A second objective is to estimate the capacities of representative sites or units to accommodate varying types of training on varying combinations of TTMs. A third function is to estimate the variable costs incurred in providing training on individual TTMs in particular training settings. Using these elemental cost estimates, various summaries can be produced to highlight constraints on present training capabilities and to assess the relative costs of various combinations of training (Rueter, Vaughan, & Feldsott, 1987).

The Integration/Optimization Subsystem (IOS) provides for the structural integration of databases in the other three subsystems; it coordinates and schedules the operation of the system as a whole. A User Interface component interacts with users of the TDS, directing the File Management component and Report Generator component to produce required products. A Modeling and Optimization component permits users to specify the elements of mathematical and simulation models and address a library of optimization routines relevant to TDS applications. This capability permits managers to examine a wide range of U & T alternatives and see the expected outcomes in terms of changing costs or impact on preferences. Reports from the system can be tailored to meet specific managers' needs and can be produced in varying levels of detail (Vaughan et al., 1984).

We provided an overview of the development of the TDS at last year's conference [Midyear Conference of the Society for Industrial and Organizational Psychology; see Collins & Vaughan, 1987]. Specific developments in the TCS have been discussed previously in substantial detail in several forums (Perrin et al., 1985, 1986, 1987; Mitchell et al., 1987). This report will focus on TDS modeling of U & T patterns, and will display some of our experimental results in this area for one Air Force career field.

III. MODELING AIR FORCE CAREER FIELDS

One of the basic functions of the FUS is to describe the current U & T Pattern of a specific Air Force specialty (AFS). This involves identifying the present jobs and training in a career field, determining the manner of personnel flow among these jobs, and describing relationships between jobs and training. This is not an easy task; we find that there are many different views or concepts of any specialty, and there are very few individuals who have a comprehensive perspective on the total career field. That is exactly what makes this function important to the TDS; we need to develop a common idea of how the specialty is structured and how its people are trained in order to have an adequate basis for discussion and decision on possible changes. Thus, development of a "model" of the specialty is a critical element for the successful operation of the TDS.

Once the U & T Pattern has been developed and validated for an AFS, a second basic FUS function is to provide a means for comparing the current U & T Pattern to alternatives that are suggested as possible improvements to some aspect of work or training in the career field. Example alternatives range from proposals to increase or decrease the level of on-the-job training (OJT) or training in Field Training Detachments (FTDs), to proposals to combine the career field with some other specialty. The TDS provides various kinds of information to facilitate such comparisons, including estimations of training costs and resources needed under the proposed configurations and projections of training requirements for jobs in possible new U & T Patterns.

Another sort of information which is very important is assessing the relative desirability of an alternative pattern; suggested alternatives must be scrutinized by people who are very knowledgeable about the career field, and compared to the present pattern according to criteria that are not necessarily empirical. Such subjective judgments can be equally as important as objective criteria in some instances.

This paper describes our efforts to model the current U & T Pattern and alternative patterns for the Inertial and Radar Navigation Systems specialty (AFS 328X4). We examined differences in preference that might exist among various groups of Air Force managers, and tried to understand some of the reasons for such differences. Finally, we also wanted to evaluate the effectiveness of the particular survey instrument used to compare the current and alternative U & T Patterns.

The current U & T Pattern for AFS 328X4 was initiated from the analysis of the specialty reported in the most recent Occupational Survey Report (OSR). Our reanalysis of the data in general validated the OSR analysis, and we found no reason to alter the jobs identified in that report; data on training programs, however, were limited. As can be seen in Figure 1, following Basic Military Training (BMT) there is one basic introductory course (ABR) for this specialty, which feeds into six initial types of jobs. After being assigned to their first job, airmen may attend system-specific FTDs, and will complete their 5-level Career Development Course (CDC); some will also attend an initial Professional Military Education (PME) course. Later jobs may be of the same type, or the airman may become a trainer or first-line supervisor. In advanced assignments, AFS 328X4 technicians have a limited number of possibilities as they

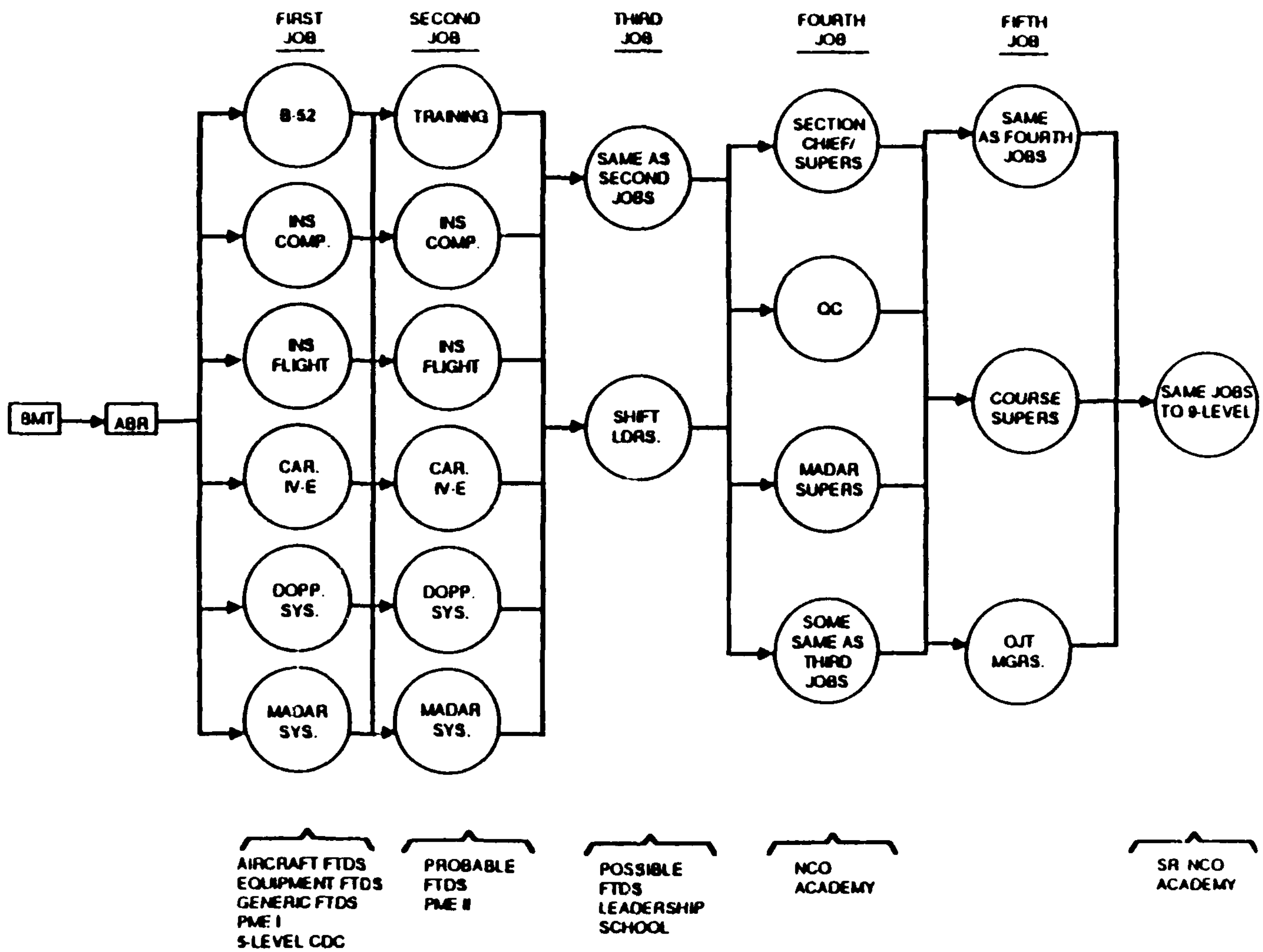


Figure 1: Current AFS 328X4 Utilization & Training Pattern

progress to senior manager positions; their training in advanced jobs is much more likely to be OJT or PME. A supplemental Job and Training History Questionnaire was administered to field personnel to help estimate the flow of individuals from BMT through training programs and jobs for their full military careers, and to help conceptualize the diversity of jobs and training within the specialty.

We defined the AFS 328X4 formal courses in terms of relevant TTMs; for example, Figure 2 displays the content of the basic 328X4 course. This information was collected from course instructors at the Technical Training Center with a structured questionnaire. Note that the hours of training are broken out into three categories: classroom, hands-on training, and self-study. The classroom and hands-on training times roughly equate to the total course length, while self-study time is not counted as formal training but is recognized as a valid component of specialty training (as is the CDC).

The jobs of the specialty can also be displayed in terms of relevant TTMs (see Figure 3). In this case, the data reflect the average percent time spent on each TTM, the cumulative time spent, the average percent time per task, and average percent performing. Such data represent a concise and quickly understood analysis of job content. Percent time for each TTM gives some sense of how involved the job is with various sets of tasks, while the percent performing data reflect the degree to which group members are involved. In the case of this example, while almost everyone in this job maintains Doppler sensor antennas and navigation equipment on aircraft, only about 13% supervise; the group includes a small subgroup of first-line work leaders.

The same kind of picture is developed for each job and for each training program, including supplemental courses and FTD programs. The final OJT is required training (as assessed in earlier training allocation surveys) that was not provided in the initial training programs.

In sum, this type of model permits us to communicate a great deal of information about the specialty--its training, jobs, and career paths--in a very concise way. Additional information, in terms of the proportions of individuals flowing from BMT through the ABR to various jobs, is also needed. Such information can be summarized in a data matrix, as shown in Figure 4. Jobs in the matrix are broken out at a finer level of detail than is reflected in Figure 1. The data matrix is the heart of a dynamic simulation. The output from the simulation is used along with quantitative TTM, Job, and Training descriptions, and training allocation reports to describe both the current and alternative configurations of the specialty.

The model developed was presented to additional subject-matter experts (SMEs) and staff managers, who resolved any questions the researchers had and suggested a few changes. Thus, it is a product of cooperative effort and, based on SME feedback, is a successful communicative tool. In addition to validating the TDS model for the AFS, the SMEs and staff personnel were also asked to provide suggestions for changing the career field. How could jobs and training be modified to better meet the mission or to make training more cost effective? Such suggestions were then modeled in the same manner as the current U & T pattern, to provide a total of six

ABR32834 001 - Avionic Inertial and Radar Navigation Systems. PDS Code 4GU
DOD 102 - Keesler; 30 wk, 4 days (154 x 8 = 1232 hrs) *

Task Training Modules	Classroom Hours	Hands-on Hours	Self-Study Hours
Block 1 - Electronics Fundamentals	672.0		
Block 2 - Avionics/Nav. Systems			
4. Training/OJT Program	6.0		2.0
9. Inspect Workcenter Equipment	3.0	6.0	2.0
17. Liasion with Job Control	2.0	2.0	1.0
22. Maintain/Prepare Tech. Orders	1.0		.5
24. Nav. Equip. Maint. On Acft	20.0	15.0	8.0
25. Inertial System	75.0	22.0	12.0
26. Navigation Unit Components	9.5	1.0	2.5
31. Doppler Systems Off Equip.	16.0	4.0	
32. Doppler Systems On Equip	19.0	16.0	
33. Doppler Nav. Comp. Cards	.5		
34. Doppler Sensor Control Boxs	.5	1.0	
36. A/C Wiring Harness	2.0		
44. Gen Purpose Nav Comp On Acft	32.0	6.0	10.0
45. Gen Purpose Nav Comp Off Acft	33.0	33.0	4.0
50. Relay Panels & INS Temp Bulbs	1.0		.5
59. Maintain WRCS	26.0	25.0	6.0
61. Weapons Release System	24.0	12.0	6.0
67. Heading Computers/Recon. Adapt.	2.0	2.0	1.0
68. Maint Inert. Comp/Off Equipment	31.0	24.5	8.0
73. Maint/Program Nav Units	5.5	3.5	2.0
Subtotals (Block 2)	309.0	173.0	65.5
Block 1 & 2 Classroom + Hands-On		1154.0	
Additional Course Hours:			
Misc. (Career progression, etc.)		20.0	
Admin. (Tests, processing, etc.)		32.0	
Military training (PT, drill & ceremonies. etc.)		26.0	
Overall ABR Course Hours		1232.0	

* Course length as of June 1986 AFM 50-5; course was recently revised to reduce course length to 21 wk, 4 days (109 days x 8 = 872 hrs) - see Sept 1987 edition of AFM 50-5.

Figure 2. AFS 328X4 Basic Resident Course Content

JOB DESCRIPTION

GENERAL DOPPLER SYSTEMS MAINTENANCE

PERSONNEL - 15 % OF SAMPLE

		No.Of	PERCENT TIME SPENT			AVERAGE PERCENT
TTM	TRAINING MODULE TITLE	TASKS	SUM	CUM	AVG	MEMBERS PERFORMING
0032	Maintain Doppler Sensor Antennas and Nav Computers (Off Equip)	29	19.74	19.74	.68	89.17
0031	Maintain Doppler Sensor Antennas and Nav Computers (On Equip)	22	14.47	34.21	.66	85.88
0024	Perform and Document Navigation Equip Maintenance On Aircraft	17	10.47	44.67	.62	84.65
0033	Maintain Doppler Nav Computer Cards	3	1.62	80.34	.54	77.84
0034	Repair and Align Doppler Sensor Control Box/Components	9	3.35	64.06	.37	63.31
0035	Repair Doppler Sensor Junction Box	5	1.66	77.08	.33	55.53
0026	Isolate and Remove Components to Navigation Units	18	6.01	50.68	.33	50.53
0044	Maintain General Purpose/Nav Computers On A/C	13	4.05	60.71	.31	48.52
0045	Align and Bench Check Gen Purpose/Nav Computers Off A/C	23	5.98	56.66	.26	41.12
0009	Inspect Workcenter Equipment	12	2.76	66.82	.23	33.71
0068	Maintain Inertial Computers and Platforms Off Equipment	11	2.27	71.42	.21	31.69
0004	Training and Conduct of OJT Program	17	2.32	69.15	.14	22.51
0025	Remove, Isolate,and Check Inertial System	12	1.63	78.71	.14	20.53
0058	Perform A/C Support	19	2.22	73.64	.12	17.05
0001	Supervise and Assign Personnel	24	1.78	75.41	.07	12.94
0076	Maintain Madar on A/C	25	1.38	81.71	.06	10.06

Figure 3. Example Job Description for AFS 328X4

FROM \ TO	ABR	IA	IB	IC	ID	IE	IIA	IIB	IIC	IID	IIIA	IIIB	IIIC	IIID	IVA	IVB	V	VI	VIIA	VIIB	VIIC	VIIIA	VIIIB	VIIIC	VIIID	VIIIE	IX	NO TYPE
BMT	4.1		0.7	0.2			0.7		0.5		0.7	1.6		0.3					0.5									0.3
ABR		2.1	6.6	4.2	0.6	0.9	2.7	1.0	6.7	4.5	8.9	19.3	3.3	2.2	5.2	2.1	1.2	0.3	15.8		0.9		0.2				1.3	0.2
CROSSTRAIN IN		1.5	6.2	1.5		1.5		1.5	4.7		1.5	1.5	7.7	3.1	1.5	3.1		1.5	3.1	1.5		21.5	4.7	1.5	3.1	6.2	6.7	16.9
COLLECT 1		2.2	6.1	3.4		2.2	3.4		2.2	2.0	6.1	10.0	0.4	2.0	5.0	2.2	0.6	1.1	10.1	0.6	1.1			0.6		1.1	6.1	17.9
COLLECT 2			6.2	1.3	0.3	1.3	1.6		5.2	2.3	2.6	6.2	13.3	1.3	2.3	1.6		1.0	6.5	1.6		13.0	2.3	1.0	1.6	5.0	5.6	15.0

FROM \ TO	FTD 002	FTD 009	FTD 014	FTD 020	FTD 031	FTD 044	FTD 047	FTD 048	FTD 049	FTD 050	FTD 052	FTD 080	FTD 086	FTD 108	FTD 117	FTD 120	FTD 124	FTD 125	FTD 126	FTD 127	FTD 128	FTD 129	FTD 131	SAF RCNG	PME I	PME II	LEADERSHIP SCHOOL	NCO ACADEMY	SR NCO ACADEMY	COLLECT 1	COLLECT 2	LEAVE 1	LEAVE 2
IA			17.4	15.0	4.2	6.3				6.7	11.1			17.4		43.4						16.6											
IB			16.7	33.3	6.3	6.3		6.3		2.0				5.5	6.3	16.6						25.4											
IC			31.3	3.3		6.3				6.3	12.5			12.5		12.6						9.4											
ID			10.0							6.7				13.3																			
IE			10.0	10.0						10.4				20.9		12.5																	
IIA	5.0		5.0	40.0		10.0				5.0			5.0	10.0		30.0																	
IIB			20.0			6.7				2.2	6.7			4.5		6.7						23.[illegible]											
IIC			10.4	2.4		6.7				2.2	3.3			4.5		3.3					3.3	10.0											
IID			11.1			55.6			11.1																								
IIIA		4.0	4.0	2.0	12.0		12.0	12.0	8.0	1.3			4.0	2.7	24.0			6.0				2.0	6.0										
IIIB	2.0	2.0		2.0	14.7	0.6	5.7	0.6				2.0	2.8		11.4		5.7	2.0		2.8			5.7	2.0									
IIIC					33.4	5.6	22.2	16.7		1.9				3.7	16.7					16.7													
IIID								6.3							6.3					6.3													
IVA	20.6							7.1				7.1					7.1	21.4															
IVB		6.3				5.3			5.3									5.3					5.3	47.4									
V					27.3		9.1																										
VI	12.5			6.2															12.5			6.3			17.1% @ 37 MOS TAPAS	32.1% @ 96 MOS TAPAS	67.5% @ 76 MOS TAPAS	31.4% @ 142 MOS TAPAS	28.9% @ 228 MOS TAPAS	35%	16%	19%	11%
VIIA	31.3				6.3		6.3					25.0	43.0					6.3						6.3									
VIIB	27.3											18.2	36.4					9.1	18.2														
VIIC	20.0											20.0	40.0			5.0		40.0	20.0														
VIIIA				2.5					5.0	1.7				3.3				15.0	5.0			2.5											
VIIIB																																	
VIIIC																		20.0															
VIIID			14.3							9.5				19.1										14.3									
VIIIE								12.5										12.5		25.0													
IX								22.7												11.1													
NO TYPE	3.6			7.1	14.3	7.1	3.6	7.1		6.7				9.5	7.1	14.3	3.6							10.7									

FIGURE 4. AVIONIC INERTIAL AND RADAR NAVIGATION SYSTEMS (AFS 328X4) PROBABILITIES

alternative U & T Patterns per specialty. Examples of several alternatives are displayed in Figures 5 through 7 for AFS 328X4.

We developed a new survey instrument, the U & T Pattern Preferences Survey (see Appendix A for a copy of the instrument), which was then administered in person to key AFS 328X4 managers at Randolph, Langley, and Offutt Air Force Bases, and at the Pentagon, during the last two weeks of July 1987. The survey asked respondents to read and evaluate the current and alternative U & T Pattern descriptions and rate their personal preference for all alternatives on a 9-point scale (1 = least preferred to 9 = most preferred). They also had the option to add any other alternative they might wish to describe, and to also rate it.

Responses were received from 11 of the 15 key managers identified for a return rate of almost 75%. The respondents were divided, based on their organization and job title, into three groups: (a) Functional Managers (n = 9 from Hq USAF or major command), (b) Personnel Managers (n = 1 from Air Force Military Personnel Center, or (c) Training Managers (n = 1 from HQ, Air Training Command). Obviously, there are too few personnel and training managers in the present sample to allow for a credible full range of preference comparisons. The present prototype effort simply demonstrates that such comparisons are possible and the kinds of information these comparisons can yield (Yadrick, Mitchell, & Knight, 1987).

Inter-rater reliability was assessed through use of the Omega squared statistic. Omega squared is used by some researchers to provide an estimate of the proportion of total system variance accounted for by one or another factor in an analysis of variance (ANOVA). Proponents argue that it is useful to know that an experimental effect is substantial enough to be of interest, as opposed to being merely statistically significant. In the present context, it is helpful to think of performing a one-way ANOVA, with the ratings as the dependent variable, the various alternatives as levels of the independent variable, and raters as subjects. High inter-rater reliability would result in much of the overall variance being accounted for by alternatives (between variance) rather than raters (within variance); Omega squared can then be taken as an index of the average reliability of a single rater (Keppel, 1982).

Some controversy surrounds both the use and interpretation of Omega squared in the context of post hoc analysis of ANOVA results. This controversy is of little direct concern here, since in the present situation Omega squared is used as an informal indicator of agreement. The admittedly arbitrary rules of thumb for interpreting this statistic found in the literature suggest that a value of .15 is a "large" effect showing high reliability, while a value of .06 reflects moderate reliability. In the present case, Omega squared equals .13, which reflects very good reliability, according to the rule of thumb adopted.

Omega squared, as noted above, indicates the average reliability of a single rater. To obtain the reliability of the entire group of raters, the Spearman-Brown correction formula was applied (Ghiselli, Campbell & Zedeck, 1981):

R(kk) = (k * Omega squared) / [1 + (k - 1) * Omega squared],

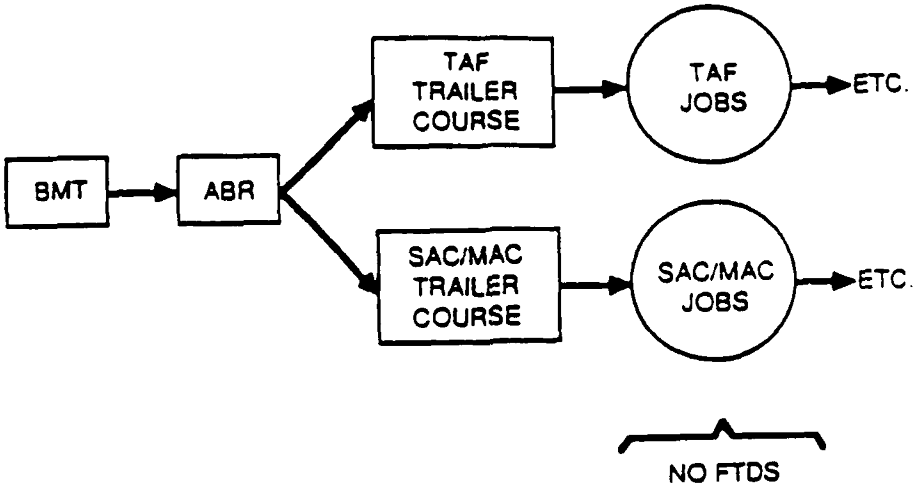


Figure 5. Alternative Utilization and Training Pattern Number 1.

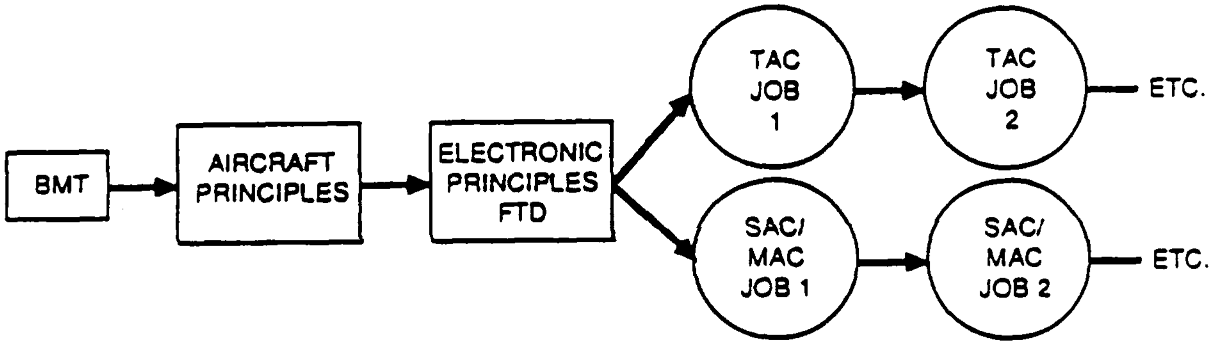


Figure 6. Alternative Utilization and Training Pattern Number 4.

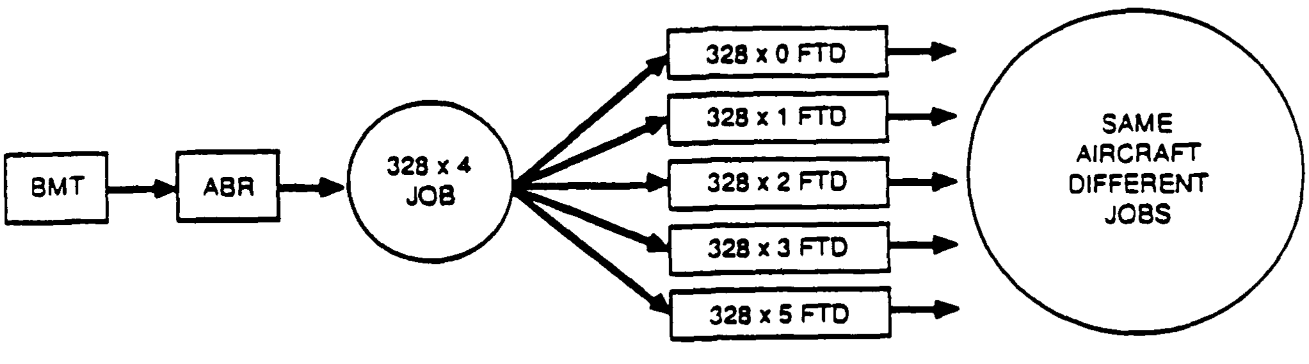


Figure 7. Alternative Utilization and Training Pattern Number 6.

where R(kk) is a corrected reliability estimate (a type of correlation coefficient) for the group rating and k is the number of raters. In this case, R(kk) = .62. From these data, we can conclude that the inter-rater reliability for the survey seems reasonably adequate although not extremely high.

[By way of comparison, in parallel studies of the other TDS specialties, our results were sometimes more substantial. For Security Police and Law Enforcement (AFS 811X0), R(kk) = .96 with 28 raters; for Electronic Computer and Switching Systems Maintenance (AFS 305X4), which is a very diverse specialty with nine shredouts, Rkk = .56; and for Aircraft Environmental Systems (AFS 423X1), R(kk) = .62 with 19 raters.]

Given the AFS 328X4 inter-rater agreement, the ratings for all raters were averaged for each U & T Alternative to assess the overall group preferences among the options. These data are displayed in Table 1.

Table 1. Overall Preferences for AFS 328X4

	Utilization and Training Patterns						
	Current	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Average Rating	5.3	5.0	4.2	4.4	2.8	4.7	6.7

It is apparent that the current pattern and alternative 6, which reflects a merger with a related specialty, received the highest ratings from the group as a whole. Alternative 1, which virtually eliminates the technical training course, was also rated well. Alternative 4, which involves elimination of the present technical school and relies on a short aircraft fundamentals course, electronics principles, and then extensive OJT, was relatively poorly regarded by all raters.

A one-way ANOVA yielded $\underline{F}$ = 2.97, with 6 df for the numerator and 70 df for the denominator. This $\underline{F}$-value is significant at the .025 alpha level. A Neuman-Keuls <u>post hoc</u> analysis for significant differences showed that preferences for Alternative 6 were significantly higher than those for Alternative 4 at alpha = .01. No other differences were statistically significant, even at alpha = .05.

These overall results might be somewhat misleading since functional managers are greatly over-represented in the sample of raters. Table 2 presents preference results broken out according to type of manager.

It is not feasible to perform additional statistical tests to analyze these data, due to small sample sizes for some groups; indeed, two groups are represented by a single individual so that there is no variance. There are some intriguing apparent differences nonetheless. The overall high rating for Alternative 6 is an artifact of the over-representation of HQ USAF Functional managers, who appear to approve of the RIVET WORKFORCE

Table 2. AFS 328X4 Preferences By Subgroup

Type of manager	Utilization and Training Patterns						
	Current	Alt. 1	Alt. 2	Alt. 3	Alt. 4	Alt. 5	Alt. 6
Functional							
HQ USAF							
Mean (N = 6)	4.8	4.5	3.7	3.2	1.7	3.5	8.2
MAJCOM							
Mean (N = 3)	6.7	7.0	4.7	5.7	3.7	5.7	5.3
Composite (N = 9)	5.4	5.3	4.0	4.0	2.3	4.2	7.1
Training							
Mean (N = 1)	6.0	5.0	5.0	8.0	2.0	7.0	4.0
Personnel							
Mean (N = 1)	3.0	2.0	5.0	4.0	8.0	7.0	6.0

concept. It is, after all, a HQ USAF initiative. Other types of managers are less enthusiastic, although this alternative received no very low ratings. Major Command representatives liked Alternative 1, the two-track system which focused training (and jobs) to large and small aircraft systems. Although differing on their first choice, functional managers chose the current U & T pattern as their second choice. If the singe raters for training and personnel are taken to be representative of their organizational perspectives, then we can note further differences. Neither rated the current U & T or RIVET WORKFORCE as their 1st or 2nd choice. Thus, there do appear to be differences attributable to organizational perspective; this may be the cause of the moderate inter-rater agreement statistic noted earlier.

Respondents were encouraged to generate their own suggestions for a U & T Pattern, but only two did so. One suggested a hybrid of Alternatives 2 and 4, with the objective of further specialization of new workers. The other suggestion was for a pattern "similar to the two-track system in Alternative 1, except that the ability to crossflow among commands should be possible at the 7-level." These write-ins seem to indicate that raters understood the U & T concept and were able to elaborate them in their suggestions.

Our interest in the prototype TDS development was in creating a protocol for collecting and assessing managers' preferences. To evaluate the relative success of this objective, an evaluation section was included as the last page of the U & T Preference Survey booklet. Participants were

asked five questions (see Table 3) and also given the opportunity to write in their comments on the survey.

Table 3. Evaluation of the AFS 328X4 U&T Preference Survey

Question	Yes	No	Uncertain	Blank
1. Is the way the U&T Pattern was shown & described useful in evaluating ways to change or improve the AFS?	73%	9%	9%	9%
2. Is the description of the current U&T Patterns for AFS 328X4 accurate?	82%	9%		9%
3. Do the descriptions provided account for the flow of people through the entire period of assignment?	91%			9%
4. Are the alternative U&T Pattern descriptions understandable?	64%	27%		9%
5. Is there a better way to ask managers for their preferences?	18%	27%	45%	9%

Overall, the response to the instrument was quite favorable. Few responses were truly negative; for the most part, respondents wrote in pertinent and explanatory comments concerning any unfavorable reactions they had. One noted a minor change in the career field not reflected in the current U&T; one critiqued the format and asked for a job title key on each diagram. Another said it would be helpful for raters to know <u>why</u> an alternative was suggested in order for the raters to make realistic choices. Analysis of responses by subgroups (Functional, Training, Personnel) indicated that the generally favorable response to the survey was typical of all managers regardless of subgroup.

IV. CONCLUSIONS

The attempt to model Air Force specialties in a way useful for the TDS was relatively successful in this prototype development effort. The U&T Patterns were generally well understood and were successfully used as a basis for communicating possible job or training changes in order to gather managers' preferences. The preference survey was also successful and raters generally liked the instrument. Participants were conscientious and helpful and suggested a number of improvements to the survey. Their comments yielded some very useful lessons. It is obvious that larger samples of raters are needed in order to properly assess the degree of agreement among raters and to identify any systematic group differences in managers' preferences among alternatives. The current and alternative models of a specialty may also be useful in evaluating the effectiveness of existing training programs, from the standpoint of how

relevant various courses are to the jobs identified. Job relevance is a necessary precondition to any assessment of the relative effectiveness of training delivery systems; unless training is job relevant, it cannot be effective (Driskill, Mitchell, & Ballentine, 1985).

As a final note, we have been able to discuss only part of the FUS modeling effort in this paper. Future reports will describe additional aspects of the FUS, including the computer simulation of job and training flows and the perspective such a dynamic model provides on AFS-specific training programs. The FUS simulation is a critical element for a TDS analysis of possible changes in AFS programs and priorities, and for predicting the effects of such changes in terms of specialty training capacities and total training costs.

REFERENCES

Air Force Regulation 35-2 (1982, 1 February). Occupational analysis. Washington DC: Headquarters, United States Air Force.

Air Force Regulation 50-5 (1986, 1 June). USAF formal schools. Washington DC: Headquarters, United States Air Force.

Collins, D.L., Hernandez, J.M., Ruck, H.W., Vaughan, D.S., Mitchell, J.L., & Rueter, F.H. (1987, August). Training decisions system: Overview, design, and data requirements (AFHRL-TP-87-25, AD-A183 978). Brooks AFB, TX: Training Systems Division, Air Force Human Resources Laboratory.

Collins, D.L., & Vaughan, D.S. (1987, April). Development of a training decisions system. Presentation in the Symposium: Toward an integrated personnel system: USAF training research and development. Society for Industrial and Organizational Psychology Second Annual Conference, Atlanta, GA.

Driskill, W.E., Mitchell, J.L., & Ballentine, R. (1985, November). Using job performance as a criterion for evaluating training effectiveness (Draft technical report under Air Force Contract F33615-83-C-0030). Brooks AFB, TX: Training Systems Division, Air Force Human Resources Laboratory.

Ghiselli, E.E., Campbell, J.P., & Zedeck, S. (1981). Measurement theory for the behavioral sciences. San Francisco: W. H. Freeman and Company.

Keppel, G. (1982). Design and analysis: A researcher's handbook. Englewood Cliffs, NJ: Prentice-Hall, Inc.

Mitchell, J.L., Vaughan, D.S., Yadrick, R.M., & Collins, D.L. (1987, May). New methods for portraying dynamic training and job patterns within Air Force specialties. Proceedings of the Sixth International Occupational Analysts Workshop (pp. 103-113). San Antonio, TX: USAF Occupational Measurement Center.

Perrin, B.M., Vaughan, D.S., Yadrick, R.M., & Mitchell, J.L. (1985, October). Defining task training modules: coperformance clustering. Proceedings of the 27th Annual Conference of the Military Testing Association (pp. 265-270). San Diego, CA: Navy Personnel Research and Development Center.

Perrin, B.M., Vaughan, D.S., Yadrick, R.M., Mitchell, J.L., & Knight, J.R. (1986). Development of task clustering procedures (Draft Technical Report under AFHRL Contract F33615-83-C-0028). Brooks AFB, TX: Manpower and Personnel Division, Air Force Human Resources Laboratory.

Perrin, B.M., Vaughan, D.S., Mitchell, J.L., Collins, D.L., & Ruck, H.W. (1987, October). Effects of data collection format on occupational analysis task factor ratings. Proceedings of the 29th Annual Conference of the Military Testing Association (pp. 96-100). Ottawa, Ontario, Canada: Canadian National Defence Headquarters.

Ruck, H.W. (1982, February). Research and development of a training decisions system. Proceedings of the Society for Applied Learning Technology, Orlando, FL.

Ruck, H.W., & Collins, D.L. (1987, October). A microcomputer simulation of an Air Force Training Decisions System. Proceedings of the 29th Annual Conference of the Military Testing Association (pp. 158-163). Ottawa, Ontario, Canada: Canadian National Defence Headquarters.

Rueter, F.H., Vaughan, D.S., & Feldsott, S. (1987). The resource/cost subsystem (RCS) of the training decisions system (TDS): Design, data requirements, and data sources (Draft Technical Report under AFHRL Contract F33615-83-C-0028). Brooks AFB, TX: Training Systems Division, Air Force Human Resources Laboratory.

Vaughan, D.S., Yadrick, R.M., Perrin, B.M., Cooley, P.C., Dunteman, G.H., Clark, B.L., & Rueter, F.H. (1984, 31 August). Training decisions system preliminary design (Draft Report under AFHRL Contract F33615-83-C-0028, CDRL 21). Brooks AFB, TX: Manpower and Occupational Research Division, Air Force Human Resources Laboratory.

Yadrick, R.M., Vaughan, S.D., Perrin, B.M., & Mitchell, J.L. (1985, October). Evaluating task training modules: SME clustering and comparisons. Proceedings of the 27th Annual Conference of the Military Testing Association (pp. 265-270). San Diego, CA: Navy Personnel Research and Development Center.

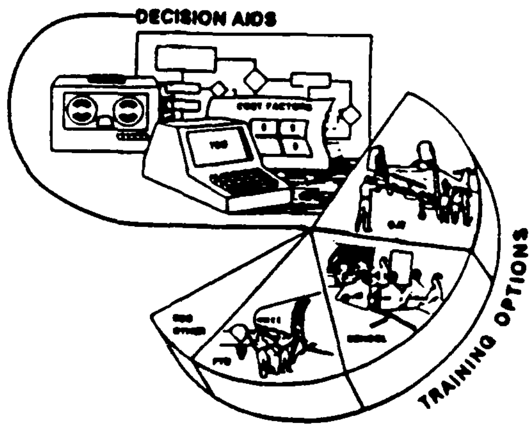
Yadrick, R.M., Mitchell, J.L., & Knight, J.R. (1987, September). Data and/or analysis summary: Report on the U & T preference survey and the FUS evaluation survey -- Task II (AFS 328X4) (Draft Report under AFHRL Contract F33615-83-C-0028, CDRL 1:18). Brooks AFB, TX: Training Systems Division, Air Force Human Resources Laboratory.

APPENDIX A

U & T Pattern Preferences Survey, AFS 328X4

UNITED STATES AIR FORCE

TRAINING DECISIONS SYSTEM



UTILIZATION AND TRAINING PATTERN PREFERENCES SURVEY

AVIONIC INERTIAL & RADAR NAVIGATION SYSTEMS

(AFS 328X4)

AFPT 80-328-178utpref

April 1987

TRAINING SYSTEMS DIVISION
AIR FORCE HUMAN RESOURCES LABORATORY
BROOKS AFB TX 78235-5601

PRIVACY ACT STATEMENT

Authority: 5 USC Sec 301, E09397, and AFR 35-2.

Principle Purposes: Collection of information concerning training program development and evaluation. SSAN for positive identifications.

Routine Area: Personnel research and personnel management system applications.

Disclosure: Failure to complete this questionnaire will detract from the Air Force's capability to carry out the programs listed above.

INSTRUCTIONS FOR BACKGROUND INFORMATION

Complete ALL items in the BACKGROUND INFORMATION section. Information concerning total time in your present job, total time in the career field, and total time in the military service is very important to this survey and should be as accurate as possible. Now turn to the next page and begin.

BACKGROUND INFORMATION

PRINT YOUR ANSWERS AND CHECK PROPER BOXES

NAME (Last, First, Middle Initial) ______________________ | MALE ( ) FEMALE ( )

SOCIAL SECURITY ACCOUNT NUMBER ___ ___ ___ - ___ ___ - ___ ___ ___ ___ | DATE (Use Numbers Only) ____ ____ ____

PRESENT GRADE: | IF CIVILIAN, PRESENT OCCUPATIONAL SERIES (Not Yor Equivalent AFSC) ___ ___ ___ ___

OFFICER	O-1 ( ) 2LT	0-2 ( ) 1LT	0-3 ( ) CPT	0-4 ( ) MAJ	0-5 ( ) LTC	0-6 ( ) COL	
ENLISTED	E-4 ( ) SRA	E-4 ( ) SGT	E-5 ( ) SSGT	E-6 ( ) TSGT	E-7 ( ) MSGT	E-8 ( ) SMSGT	E-9 ( ) CMSGT

IF CIVILIAN, CHECK PAY SCHDULE AND PRESENT GRADE:

GS ( ) GM ( ) WG ( ) WL ( ) WS ( )

5 ( )	6 ( )	7 ( )	8 ( )	9 ( )
11 ( )	12 ( )	13 ( )	14 ( )	15 ( )

FOR HOW MANY MILITARY AND CIVILIANS ARE YOU THE IMMEDIATE SUPERVISOR? (Include only those who report directly to you) ________

| AUTOVON PREFIX ___ ___ ___ | TELEPHONE NO (Duty Ext.) ________

MAJOR COMMAND (Check One Box)

( ) AAC ( ) AFCC ( ) AFSC ( ) ATC ( ) ESC* ( ) HQ USAF

( ) MAC ( ) PACAF ( ) SAC ( ) TAC ( ) USAFA ( ) USAFE

( ) Other Unit or Organization (Not under Major Command)

Identify: ______________________

* Electronic Security Command

***** CONTINUED ON THE BACK OF THIS PAGE *****

BACKGROUND INFORMATION (CONTINUED)

NAME OF BASE OR LOCATION

____

TITLE OF PRESENT JOB OR POSITION (Duty Assignment) (NOTE: Do not give just the title of your Air Force specialty or civilian occupational series)

____

TIME IN PRESENT JOB: (Duty Assignment in present unit on current tour only)

____ YEARS ____ MONTHS

TIME AT PRESENT BASE OR INSTALLATION (On Current Tour Only)

____ YEARS ____ MONTHS

IF CIVILIAN, HOW LONG HAVE YOU BEEN A GOVERNMENT EMPLOYEE?

____ YEARS ____ MONTHS

IF MILITARY, HOW MUCH TOTAL ACTIVE FEDERAL MILITARY SERVICE (TAFMS) DO YOU HAVE?

____ YEARS ____ MONTHS

FOR OFFICERS ONLY:

HOW MUCH ACTIVE COMMISSIONED SERVICE DO YOU HAVE?

____ YEARS ____ MONTHS

COMPONENT: ( ) REGULAR ( ) RESERVE

DUTY AFSC: __ Prefix __ __ __ __ A F S C __ Suffix

PRIMARY AFSC: __ Prefix __ __ __ __ A F S C __ Suffix

IF CROSSTRAINED, WHAT AFSC DID YOU HAVE PREVIOUSLY? __ Prefix __ __ __ __ A F S C __ Suffix

AFS 328X4 UTILIZATION AND TRAINING PREFERENCES
INSTRUCTIONS

The following pages graphically and verbally portray seven different utilization and training (U&T) patterns for the Avionic Inertial and Radar Navigation Systems specialty, covering the time one enters Basic Military Training until one leaves the career field or retires from the Air Force. The first U&T pattern is the present one and is based largely on information collected from MAJCOM functional managers, Occupational Survey Data, and interviews with 328X4 personnel assigned to several bases in the CONUS. The remaining six patterns are alternatives to the current one which were developed through interaction with career field managers, discussed in AF conferences, or derived from objective data as possible options for changing the present structure of the 328X4 career fields.

Please read the descriptions of the current and all alternate patterns to develop an overall understanding of the options. Once you complete this task, you will be asked to provide ratings on your individual preferences at the end of the booklet.

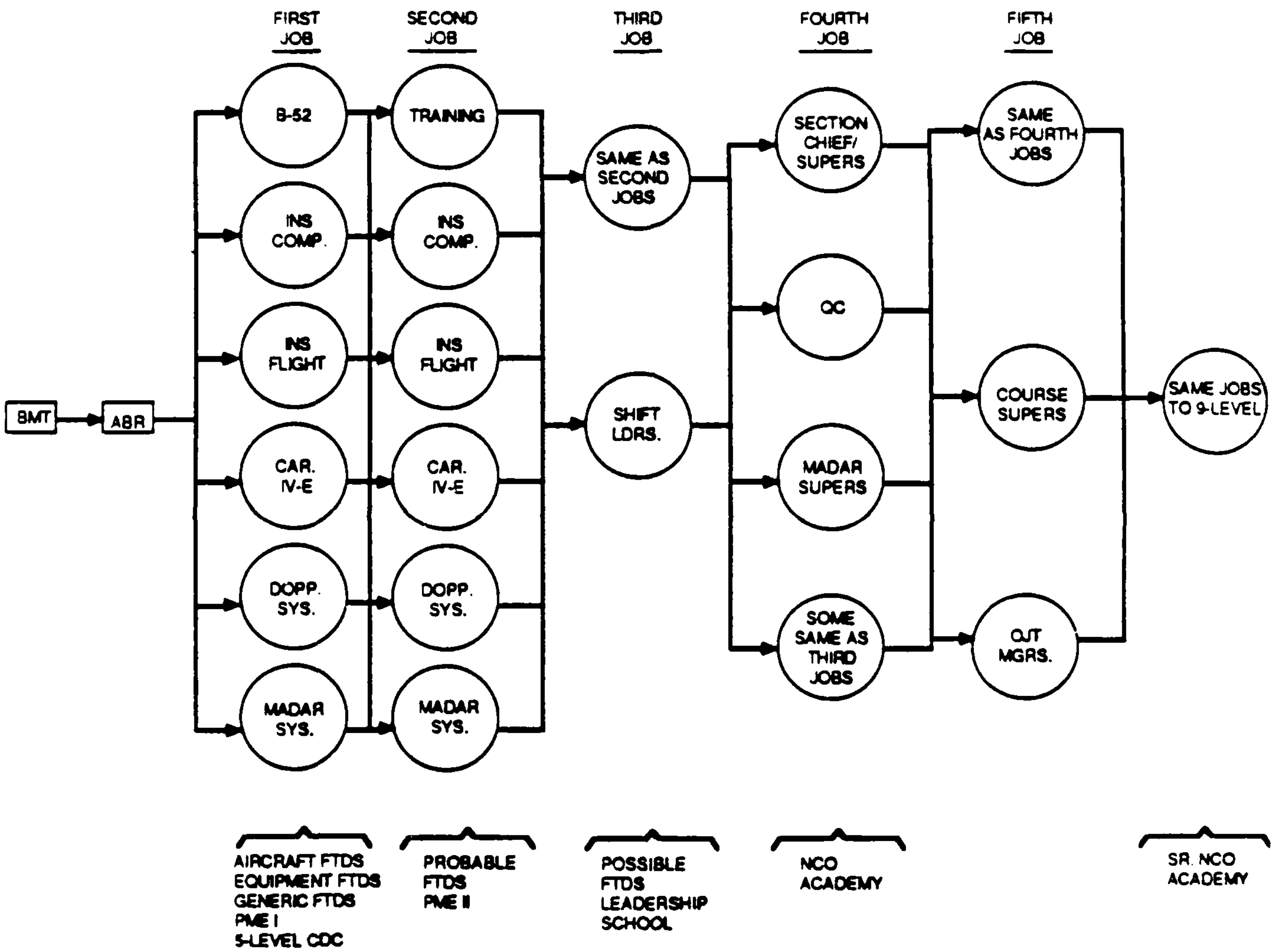
Your job, as a manager of the career field, is to rate these options on a 9-point scale, according to your preferences as to what is best for the Air Force. In addition, space is provided for you to describe and rate any other U&T pattern not described in the seven options listed.

After providing your preference ratings, you are also asked to evaluate this booklet and process in terms of how well we have captured the issues of your specialty. The results of this project will be briefed to AFS functional managers at the next Training Decisions System progress review.

Disclaimer Note: The purpose of this research is the development of methods for gathering managers' preferences. While some of the alternatives listed in this booklet are based on functional manager plans, most are made up just for this research. NONE OF THE OPTIONS LISTED HERE, SUCH AS CONTRACTING FOR 328X4 WORK, ARE PRESENTLY BEING CONSIDERED FOR IMPLEMENTATION BY FUNCTIONAL MANAGERS OR THE AIR STAFF.

CURRENT PATTERN

328X4 UTILIZATION AND TRAINING



The following is a brief description of the current job structure and training programs which AFS328X4 specialists encounter as they proceed through their careers. Please remember that the description is meant to be typical and summary, and may not describe the career progression of all individuals with accuracy.

Upon completion of Basic Military Training, individuals attend the 30.8 week 3ABR32834 course at Keesler AFB. Over half (18 wks) of this initial training is spent on principles of electronics while the remaining

12.8 weeks is spent learning about the actual repair of navigation equipment. Upon successful completion of technical school each graduate proceeds to their initial job assignment. Forty-one percent of newly assigned 32834s are typically allocated to the Tactical Air Forces (TAC, PACAF, or USAFE), while 21 % and 29% are assigned to SAC and MAC, respectively.

Initial Assignment - A newly graduated 32834 airman is assigned to one of six basic jobs during his initial assignment. These jobs include the following:

1. INS Component Repair (shop) - TAF (labeled INS COMP. in the diagram)
2. INS Flightline Maintenance - TAF (INS FLIGHT.)
3. Doppler Systems Repair - SAC/MAC (DOPP. SYS.)
4. Carousel IV-E Repair - MAC (CAR. IV-E)
5. B-52G/H Navigation System Repair - SAC (B-52)
6. Madar System Repair - MAC (MADAR SYS)

In most cases each individual will attend a Field Training Detachment (FTD) for a either a particular aircraft or a specific piece of equipment. Ideally, FTD attendance occurs prior to first job entry, but in practice attendance sometimes comes within a few months after work begins in the first job. Other FTD courses are available during the course of one's first job and some personnel attend such "generic" courses as Maintenance Data Collection, General TO's, High Reliability Soldering, Digital Techniques, or Solid State and Integrated Circuits. In addition, the member usually completes the 5-level CDC and attends phase I PME during this period.

Second Assignment - The optimal second assignment would consider the individual, the training he/she has already received, and natural job flow. Ideally, a 32854 would stay working on the same weapon system and keep the same job. Due to the complexities of the Air Force personnel system, this best fit is not always possible. Therefore, at least four possibilities exist for transition from first to second assignment:

1. Same job - different a/c (i.e. C-135 to C-141 Doppler)
2. Same job - same a/c (i.e. F-15 CONUS to F-15 USAFE)
3. Different job - same a/c (i.e. C-5 Carousel IV-E to Madar)
4. Different job - diff a/c (i.e. INS [TAC] to Doppler [MAC])

About 40% of all personnel choose to leave the Air Force at the end of their first enlistment, which sometimes coincides with the end of the first job assignment. For those who stay, five of the six first assignment jobs remain available for the second assignment cycle (few first-assignment people apparently work on B-52s). In addition, some second assignment personnel begin work as Technical Training Personnel (labeled TRAINING in the diagram).

Therefore, the training burden for the second job cycle varies from no FTD of any kind for those who remain in the same job and same aircraft to attendance of anywhere from one to three 328X4 FTDs for those who change jobs and aircraft. In addition, a number of personnel attend generic FTD courses. Many individuals will upgrade to the 7-skill level as well as

complete second and/or third level PME during this cycle.

Third Job - By the third job assignment most personnel are spending increasing amounts of time on supervisory or training activities, although still performing many of the same technical functions as before. Some have become shift leaders (SHIFT LDRS.). As before, personnel will flow into different jobs and work on different aircraft but because of understaffing sometimes will not be afforded the luxury of an aircraft-specific FTD. Therefore, FTD attendance is not as likely at this level as during the first and second jobs.

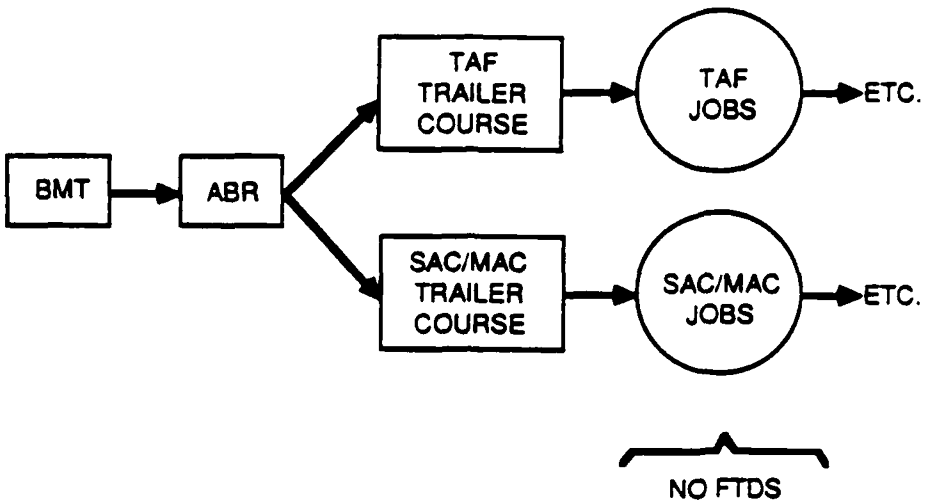
At some point during this period, it becomes likely that a member will attend NCO Leadership School and a generic FTD related to training or technical advancement. No 7-level CDC is available for this speciality.

Fourth job - By this point in a career, new types of jobs appear and are staffed by increasingly senior personnel. Members work in Quality Control (QC in the diagram), as Section Chiefs and Supervisors (SECTION CHIEFS/SUPERS), and a small group works as Flightline Supervisors on MADAR systems (MADAR SUPERS). In addition, many technical jobs carry over to this level. Some people may attend the NCO Academy and perhaps a Generic FTD, although an aircraft FTD becomes even more unlikely than at the preceeding level.

Fifth job - From this level forward all 328X4 jobs are supervisory or managerial in nature. In addition, the 9-level is combined with the 328X0, 328X1, 328X2, 328X3, and 328X5 specialities. Many will attend the Air Force Senior NCO Academy. Retirement becomes a possibility for many.

ALTERNATIVE PATTERN 1

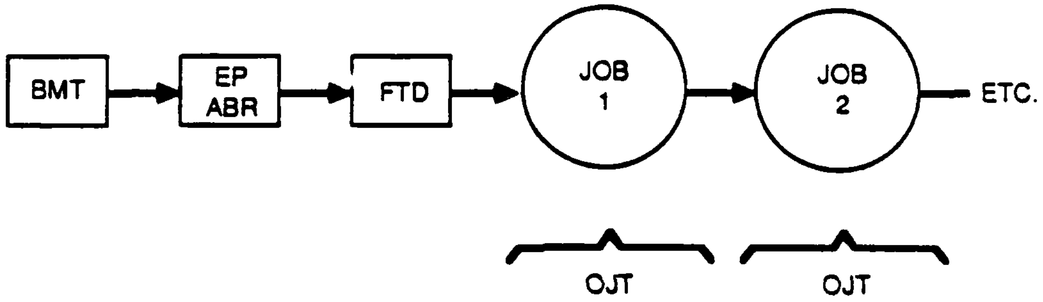
Two Track System - Tactical or Strategic/Airlift



This pattern front loads the entire training process by having two separate trailer courses after the ABR course. The trailer course for an individual would involve either tactical or strategic/airlift aircraft. Graduates would then proceed into either a tactical or s/a career track and remain there until they left the Air Force through attrition or retirement. All other 328X4 jobs would be performed by civilian contract (e.g., ATC technical training, AFSC jobs). Since all training occurs before the initial assignment, no FTDs would exist at operational bases. If a special need ever arose for a specific course , the requirement would be satisfied by Factory/Contract training, Mobile Training Teams, or special Technical School attendance. The structure of jobs is quite similiar to the current pattern but without training jobs, which would be performed by civilian contract. Strict adherence to the two tracks would keep personnel performing basically the same job on the same weapon system throughout an entire career.

ALTERNATIVE PATTERN 2

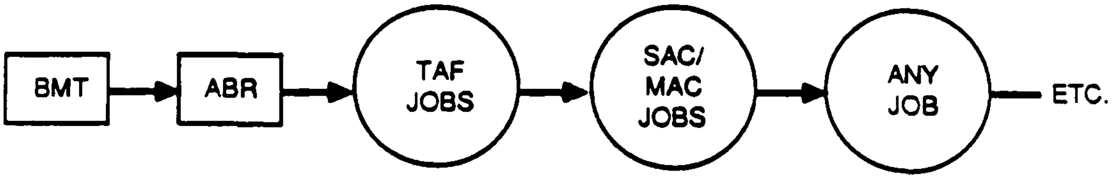
Increased OJT/FTD Role



This pattern requires the maximum training affordable once the individual is assigned to operational units. A heavy emphasis is placed on OJT with an FTD playing a minor role. The technical school would only teach 18 hours of electronic principles theory, and all practical aspects of job performance would be learned through OJT or FTD. Job flow would remain the same as in the current pattern but more of an apprentice - journeymen system would be evident early in an airman's career.

ALTERNATIVE PATTERN 3

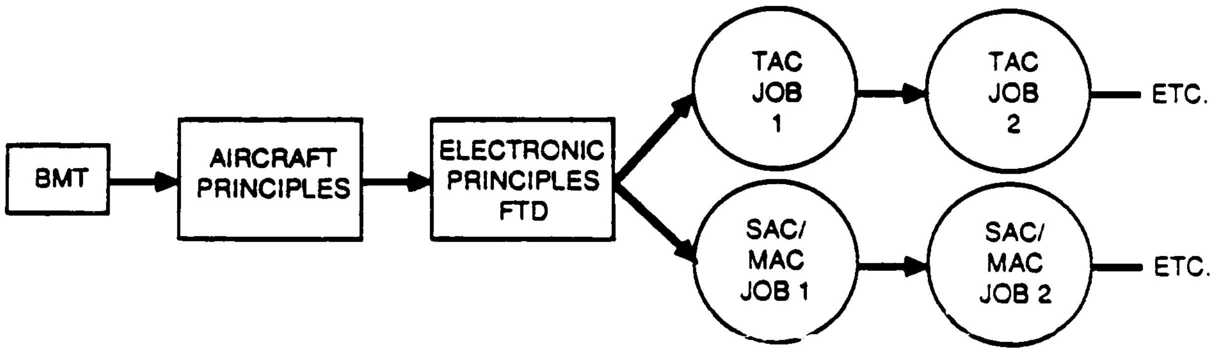
MAJCOM Cross Flow (Versatile Workforce)



This pattern is intended to ensure a versatile workforce by allowing maximum cross-flow between different aircraft, equipment, and jobs. Technical School would remain as presently structured but graduates would only flow into Tactical jobs for their initial assignment. Second assignment would be into either a Strategic or Airlift job. All jobs would basically be the same as the current pattern. Thus, by the third or fourth job each individual in the career field could be a well-rounded and versatile technician and supervisor.

ALTERNATIVE PATTERN 4

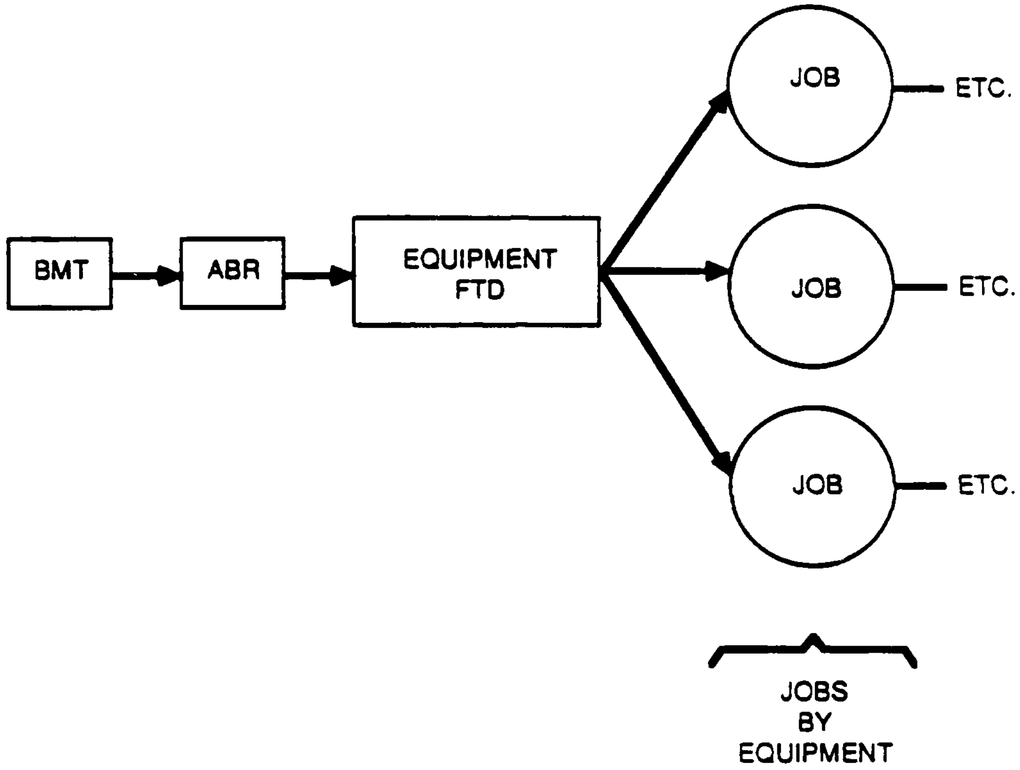
No Technical School



This pattern would allow for all training to occur at the first operational assignment. In other words, the ATC technical school would no longer be required. BMT would be followed by an aircraft principles course approximately a week long, and then by an FTD to teach basic electronic principles. He or she would then proceed to their first assignment. All assignment actions from this point on would keep an individual in the same MAJCOM.

ALTERNATIVE PATTERN 5

SEI by Equipment



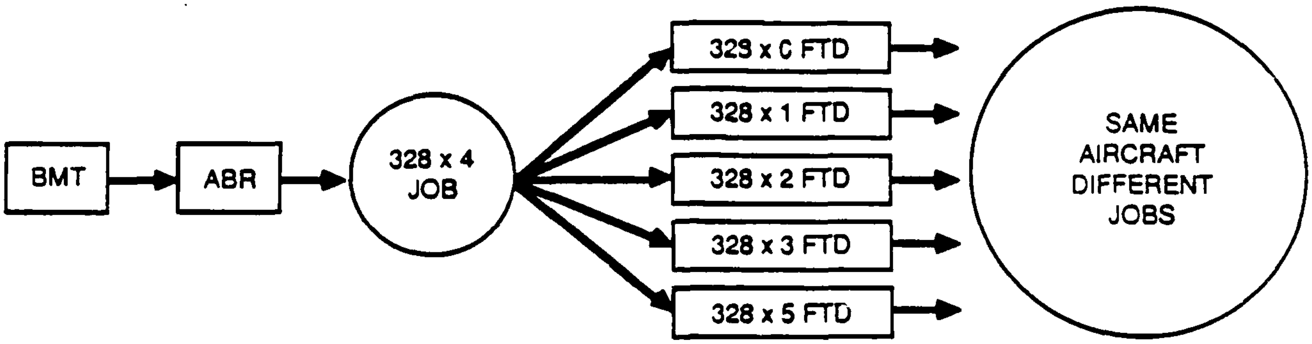
The career field would be highly specialized under this pattern. Upon completion of technical school and prior to their first job, each individual would receive FTD training on particular designated equipment. Specific categories of these types equipment might include the following:

Doppler
Carousel
Madar
Omega
Nav computer
Weapons release
Astro INS

Each of these categories of equipment would carry a SEI. Individuals would be assigned according to the SEIs they possess and earn as they proceed through the career field.

ALTERNATIVE PATTERN 6

Rivet Workforce



This option would configure the career field in the spirit of the "Rivet Workforce" initiative. Certain portions of AFSCs 328X0, 328X1, 328X2, 328X3, 328X4, and 328X5 merge into another AFSC. In addition to current tasks, a 328X4 would learn how to maintain equipment that is presently maintained by personnel in the other specialties. However, once assigned to a weapon system, he or she would never leave that particular aircraft. The final job structure under this pattern would be different from the present structure, but just how different would depend on which additional equipment an individual maintained. In addition, a 328X4 could crosstrain into one of the other AFSCs, although an FTD would be required for this. Thus, more initial usage of FTDs is likely with this alternative than with the current pattern.

OTHER

Please feel free to describe any other pattern you feel is a suitable alternative to the present structure of the 328X4 career field.

RATING SECTION

Please rate the patterns described in the preceding pages in terms of your own personal preference. Use the the 9 point scale provided.

PLEASE FILL THIS SECTION OUT USING A RATING OF "1" TO INDICATE THAT THE ALTERNATIVE IS LEAST PREFERRED, AND USING A RATING OF "9" TO INDICATE THAT AN ALTERNATIVE IS MOST PREFERRED.

If you filled in an alternative pattern of your own, you may use the space provided to rate it as well.

	Least				Preferred				Most
CURRENT U&T	1	2	3	4	5	6	7	8	9
TWO TRACK (TAF OR SAC/MAC) SYSTEM	1	2	3	4	5	6	7	8	9
INCREASED OJT/FTD ROLE	1	2	3	4	5	6	7	8	9
MAJCOM CROSS FLOW - VERSATILITY	1	2	3	4	5	6	7	8	9
NO TECHNICAL SCHOOL	1	2	3	4	5	6	7	8	9
SEI BY EQUIPMENT	1	2	3	4	5	6	7	8	9
RIVET WORKFORCE	1	2	3	4	5	6	7	8	9
OTHER	1	2	3	4	5	6	7	8	9

EVALUATION SECTION

Please answer the following questions about this Preference Rating exercise by checking the appropriate block at the right. If you wish, feel free to write in comments to clarify your evaluation. If you need more space, continue on the back of this page.

Is the way the Utilization and Training Pattern was shown and described in this booklet useful in evaluating ways to improve or change the 328X4 career field? Yes___ No___ Uncertain___

Is the description of the current Utilization and Training Pattern for the 328X4 career field accurate? Yes___ No___ Uncertain___

Do the descriptions provided account for the flow of people through the entire period of assignment? Yes___ No___ Uncertain___

Are the alternate patterns understandable? Yes___ No___ Uncertain___

Is there a better way to ask managers for their preferences? Yes___ No___ Uncertain___

Describe:

Other Comments?